Claims

1. A filter comprising:

a first pole having a biquadratic low pass characteristic and configured to provide a first low pass signal;

a second pole coupled to said first low pass signal, said second pole having a first-order low pass characteristic, and providing a second low pass signal and a high pass signal;

a third pole coupled to said second low pass signal and having a biquadratic low pass characteristic for generating a third low pass signal; and

a signal combiner for combining said third low pass signal and said high pass signal to provide a combined signal.

2. The filter according to claim 1, further comprising a fourth pole coupled to said combined signal, said fourth pole having a biquadratic low pass characteristic.

3. The filter according to claim 1, wherein said biquadratic characteristic of said first pole corresponds to a first bandpass frequency, said biquadratic characteristic of said third pole corresponds to a third bandpass frequency, and said first bandpass frequency is lower than said third bandpass frequency.

4. The filter according to claim 2, wherein said biquadratic characteristic of said first pole corresponds to a first bandpass frequency, said biquadratic characteristic of said third pole corresponds to a third bandpass frequency, said biquadratic characteristic of said fourth pole corresponds to a fourth bandpass frequency, and said first bandpass frequency is lower than said third and said fourth bandpass frequency.

6. The filter according to claim 1, wherein said high pass signal corresponds to a portion of said first low pass signal rejected by said second pole.

6 ~~7.~~ The filter according to claim 1, wherein said filter has a frequency related characteristic having (i) a first component defined by an in-line signal path through poles in said filter including said third pole and (ii) a second component defined by a signal path bypassing said third pole, said first component having a roll-off characteristic above a first predetermined frequency, and said second component having a roll-off characteristic above a second predetermined frequency higher than said first predetermined frequency.

7 ~~8.~~ The filter according to claim 7, wherein said second component is configured to compensate for said roll-off characteristic of said first component above said first predetermined frequency.

8 ~~9.~~ The filter according to claim 1, wherein the filter is a tuner filter.

9 ~~10.~~ The filter according to claim 1, wherein said filter is implemented in an integrated circuit.

10 ~~11.~~ The filter according to claim 1, wherein the filter is an Gaussian family filter.

11 ~~12.~~ The filter according to claim 11, wherein the filter is an equiripple filter.

12 ~~13.~~ A circuit for use in a tuner for tuning to a selected channel among a plurality of channels in a received signal, the circuit comprising:

a down-converter for down-converting said received signal to a baseband signal within a baseband, such that a frequency of said selected channel is aligned with said baseband;

a first nth order low pass filter for receiving the baseband signal from the down-converter and for generating a first low pass filter signal, said first low pass filter having a filter characteristic which is nth order where n is an integer greater than one;

a second pth order low pass filter downstream of said first nth order low pass filter for generating a second low pass filter signal, said second low pass filter having a filter characteristic which is pth order where p is an integer greater than zero; and

a bypass path downstream of said first low pass filter for generating a high frequency boost signal bypassing said second pth order low pass filter.

13 ~~14.~~ The circuit according to claim 13, wherein p is an integer greater than one.

14 ~~15.~~ The circuit according to claim 13, wherein said nth order low pass filter and said pth order low pass filter are 2nd order low pass filters.

15 ~~16.~~ The circuit according to claim 13, further comprising:

a signal combiner for combining said second low pass filter signal and said high frequency boost signal downstream of said second pth order low pass filter; and

a third qth order low pass filter downstream of said signal combiner for generating a third low pass filter signal, said third low pass filter having a filter characteristic which is qth order, where q is an integer greater than zero.

16 ~~17.~~ The circuit according to claim 13, wherein at least one of said first and said second low pass filters is a biquadratic filter.

17 ~~18.~~ The circuit according to claim 13, wherein the circuit is implemented in an integrated circuit.

18 ~~19.~~ A filter comprising:

a plurality of filter poles coupled in series; and

a bypass path for bypassing one or more but not all of said filter poles;

wherein said filter has a frequency related characteristic having a first component defined by an in-line signal path through said poles in said filter including said one or more filter poles, and a second component defined by said bypass path,

wherein said first component has a magnitude roll-off characteristic above a first predetermined frequency and a group delay extending to at least a second predetermined frequency higher than said first frequency without peaking,

wherein said second component has a magnitude roll-off characteristic above said second predetermined frequency, said second component being configured to compensate for said magnitude roll-off characteristic of said first component above said first predetermined frequency;

wherein said first and said second components combine to provide a substantially flat magnitude characteristic to said second predetermined frequency.

19 ~~20.~~ The filter according to claim 19, wherein said filter is a Gaussian family filter.

20 ~~21.~~ The filter according to claim 20, wherein said filter is an equiripple filter.

21 ~~22.~~ The filter according to claim 19, wherein said second frequency is about twice the first frequency.

22 ~~23.~~ A method of filtering a signal comprising the steps of:

(A) first biquadratic second order low pass filtering said signal to provide a first signal;

(B) first order low pass filtering said first signal to provide a second signal and a high pass signal;

(C) second biquadratic second order low pass filtering said second signal to provide a third signal; and

(D) combining said third signal and said high pass signal to provide a fourth signal.

23 ~~24.~~ A filter comprising:

first means for biquadratic second order low pass filtering said signal to provide a first signal;

means for first order low pass filtering said first signal to provide a second signal and a high pass signal;

second means for biquadratic second order low pass filtering said second signal to provide a third signal; and

third means for combining said third signal and said high pass signal to provide a fourth signal.